Qiuyi Wu

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Research Interests Functional Data Analysis, Kernel Smoothing, Image Processing, High Dimensional Regression, Text Mining, Recommender System, Spatial Statistics, AI Fairness

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Education

2019-2024 Ph.D. Candidate in Statistics, United States (2024 Expected)
University of Rochester, Department of Biostatistics and Computational Biology
Thesis: Image Processing with Optimally Designed Parabolic Partial Differential Equations

2016-2018 M.S. in Applied Statistics, United States
Rochester Institute of Technology, School of Mathematical Sciences
Thesis: Statistical Aspects of Music Mining – Native Dictionary Representation

2012-2016 B.S. in Finance; Textile Engineering (1^{st} yr), China
Donghua University, Glorious Sun School of Business and Management
Thesis: Impact of Index Futures On Stock Market Volatility - Based On GARCH Model

Honors and Awards

Scholarship

- **William Jackson Hall Graduate Student Fellowship** for academic excellence, 2023-2024
  awarded annually to one PhD student in UR Biostat Dept through the combination of outstanding performance in coursework and qualifying exams; excellence in their service as a graduate student teaching assistant; and timely completion of a dissertation containing work judged to be of particular significance in both its methodological contribution and potential impact in applications.
- **Dean's Ph.D. Fellowship** for PhD study in University of Rochester, 2019-2021
- **RIT Merit Scholarship** for Master Study in RIT, 2016-2018

Conference Award

- **Gold Medal for Data Analytics Competition** in UpStat Conference, 2021
- **ASA Section on Text Analysis Best Student Presentation Award** in JSM Conference, 2020
- **Gold Medal for Best Student Research Award** in UpStat Conference, 2019
- **NC ASA Young Researcher Award** in AISC Conference, 2018
- **Gold Medal for Best Student Research Award** in UpStat Conference, 2018
- **Young Scientific Leader Award** in UpStat Conference, 2017 - 2018
- **Student Scholarship Winners** for SAS Global Forum, 2017

Travel Award

- **SIAM SEAS Travel Award** for SIAM SEAS Conference, *VT*, 2023
- **JSM DWMP Travel Award** for JSM Conference, *Washington DC*, 2022
- **ACNN Travel Award** for Big Data Neuroscience Workshop, *UMich*, 2019
- **SAMSI Travel Award** for Deep Learning Opening Workshop, *Duke*, 2019
- **ASA Travel Award** for IMS/ASA Spring Research Conference, *VT*, 2019
- **RIT Research & Creativity Travel Award** for JSM Conference, *Vancouver*, 2018

Publications

Published or Accepted:

2023 LeBlanc, P., Banks, D., Fu, L., Li, M., Tang, Z., **Wu, Q.** (2023). "Recommender Systems: A Review" *Journal of the American Statistical Association (2023)*: 1-21. doi: 10.1080/01621459.2023.2279695

2023 Panisch, L., Murphy, H., **Wu, Q.** et al (2023). "Adverse childhood experiences predict diurnal cortisol throughout gestation." *Psychosomatic Medicine*. 85(6), 507-516.

2022 **Wu, Q.** et al (2022). "A conditional approach for joint estimation of wind speed and direction under future climates." *Advances in Statistical Climatology, Meteorology and Oceanography* 8.2: 205-224.

2022 Murphy, H., Gu, Y., **Wu, Q.**, et al (2022). "Prenatal Diurnal Cortisol: Normative Patterns and Associations with Affective Symptoms and Stress." *Psychoneuroendocrinology (2022):* 105856.

2021 Frigau, L., **Wu, Q.**, Banks, D. (2021). "Optimizing the JSM Program." *Journal of the American Statistical Association (2021)*: 1-21. doi: 10.1080/01621459.2021.1978466

2018 **Wu, Q.**, Fokoue, E., & Kudithipudi, D. (2018). "An Ensemble Learning Approach to the Predictive Stability of Echo State Networks. *Journal Of Informatics And Mathematical Sciences"*, 10(1 & 2), 181 - 199. doi: 10.26713/jims.v10i1-2.827

2018 **Wu, Q.** (2018). "Statistical Aspects of Music Mining: Naive Dictionary Representation." *Thesis*. RIT Scholar Works. *Accessed from https://scholarworks.rit.edu/theses/9932*

Under Review:

2022 LeBlanc, P.; **Wu, Q.**, et al. (2022). New Ideas in Recommender Systems (submitted to Journal of Statistical Theory and Practice)

2022 Murphy, H., **Wu, Q.**, et al. (2022). Examining the bidirectional relationship between cortisol and gestational weight gain across pregnancy (submitted to International Journal of Obesity)

In Preparation:

2024 **Wu, Q.**, Qiu, X. (2024). Image Processing with Optimally Designed Parabolic Partial Differential Equations

2024 **Wu, Q.**, Qiu, X. (2024). Optimal Gaussian Kernel Smoothing Strategy

Ad-hoc

2021 Short Interview Piece appears in July 2021 issue of Amstat News magazine "TAIG Contest Winners Tell of Experience"

Archived:

2019 **Wu, Q.**, Fokoue, E. (2019). Naive Dictionary On Musical Corpora: From Knowledge Representation To Pattern Recognition. *arXiv:1811.12802*

Research Experience

Jun.2022 - Aug.2022 **Liberty Mutual Insurance Company**, GRS Advanced Analytics team, US
Data Scientist Intern
Mentor: Dr. Robert Yuen
Project Topic: Predicting the profitability of construction projects via structured data and NLP

Jun.2020 - Aug.2020 **Argonne National Laboratory (ANL)**, CELS/EVS Division, US
Research Aide Intern
Mentor: Dr. Jiali Wang & Dr. Whitney Huang & Dr. Julie Bessac
Research Fields: Uncertainty Quantification; Wind Modeling

Jun.2019 - Aug.2019 **Argonne National Laboratory (ANL)**, CELS/MCS Division, US
Research Associate
Mentor: Dr. Julie Bessac & Dr. Whitney Huang & Dr. Jiali Wang
Research Fields: Spatial Statistics; Extreme Value Analysis

May.2018 - May.2019 **Statistical and Applied Mathematical Sciences Institute (SAMSI)**, US
Graduate Research Fellow
Mentor: Dr. David Banks
Research Fields: Text Mining; Spatial Statistics

Dec.2016 - Nov.2017 **Rochester Institute of Technology**, Department of Computer Engineering, US
Research Assistant
Mentor: Dr. Dhireesha Kudithipudi & Dr. Ernest Fokoué
Research Fields: Neural Networks; Ensemble Learning; Topic Modeling

Teaching Experience

2019-2023 **University of Rochester**: Teaching Assistant, Guest Lecturer

- BST 426 [Spr 24] - Linear Models
- BST 426 [Spr 23] - Linear Models
- BST 467 [Spr 21] - Applied Statistics in the Biomedical Sciences
- BST 467 [Spr 20] - Applied Statistics in the Biomedical Sciences

2017-2018 **Rochester Institute of Technology**: Teaching Assistant

- STAT 747 [Spr 18] - Principles of Statistical Data Mining
- MATH 251 [Spr 17] - Probability and Statistics

Consulting Experience

- Department of Biostatistics, University of Rochester.
  Responsibilities: To assist members of URMC academic community with statistical design, data analysis, and software issues for their research.

- Environmental Influences on Child Health Outcomes (ECHO-UPSIDE project)
  Responsibilities: Statistical design, data analysis and paper writing for URMC ECHO researches using models such as ICC, PCA, CCA, LMER etc.
  - Prenatal Diurnal Cortisol paper: I carried out the statistical analysis by building the lmer model, wrote code for the team and revised the statistical section of the paper.
  - Adverse Childhood Experience paper: I developed the analytic approach in the paper, edited and revised the final draft.
  - Fetal Growth project: I wrote a function to calculate estimated fetal weight percentile based on infant demographics and help the team gain insights about fetal growth curve patterns.
  - Immune Age Difference paper: I introduced the "immune age difference," a novel variable reflecting the relative maturity of infants' immune systems.
  - Baby Cortisol Analysis project: I conducted statistical imputation method to resolve the missing data issue in the analysis.
  - Mom Postnatal Analysis project: I did statistical analysis to batch correct the problematic batches and outliers in the data.

Professional Service and Volunteerism

- **Officer & Webmaster**, *ASA Section on Text Analysis*, 2023 - Present
- **Session Chair**, "Approaches in Clustering for Analysis of Emerging Data Types", *JSM*, 2022
- **Committee Member**, *ICSA 2020 Applied Statistics Symposium Photo Contest*, 2021
- **Student Representative**, *ASA Text Analysis Interest Group*, 2020 - Present
- **Event Editor**, *International Astrostatistic Association*, 2018 - Present
- **Committee Member**, *ICSA 2020 Applied Statistics Symposium Talent Show*, 2020
- **Session Chair**, *8th Annual Conference of the Upstate New York Chapters of ASA*, 2019
- **Journal Reviewer**, *IEEE Transactions on Systems, Man and Cybernetics: Systems*, 2019
- **Session Organizer**, Chair Session "Application of Text Mining", *UpStat Conference*, 2018
- **Judge** for Pre-College Statistical Data Analysis Competition, *UpStat Conference*, 2018
- **Judge** for Undergraduate Data Competitation, *ASA DataFest*, 2018
- **Mentor** for Data Competition, *ASA DataFest*, 2017 - 2018
- **Session Organizer**, Chair Session "Environment and Health", *UpStat Conference*, 2017
- **Technical Translator**, Deep Learning for NLP at Oxford with Deep Mind, *Big Data Digest*, 2017
- **Volunteer** for Imagine RIT: Innovation + Creativity Festival, *Imagine RIT*, 2017
- **Peer Mentor**, *CET Academic Programs*, 2015 *(Honored with Best Mentor via election)*

Presentations

Mar.2023 SIAM Southeastern Atlantic Section Conference 2023 - Blacksburg VA, US - SIAM23
Contributed, A conditional approach for joint estimation of wind speed and direction under future climates

Aug.2022 Joint Statistical Meetings 2022 - Washington DC, US - JSM2021
Topic Contributed, Text Mining and Music Mining

May.2022 UR Biostatistics Department Annual Student Workshop - Rochester, NY - URMC
Seminar Talk, Partial Differential Equation & Kernel Smoothing Modeling In Image Analysis

Sep.2021 Classification and Data Analysis Group Conference - Florence, Italy - CLADAG
Invited, Minimizing Conflicts of Interest: Optimizing the JSM Program

Aug.2021 Joint Statistical Meetings 2021 - Seattle (Virtual), US - JSM2021
Topic Contributed, Minimizing Conflicts of Interest: Optimizing the JSM Program

Feb.2021 Data Science DC - Washington DC (Virtual), US - DSDC/TAIG
Invited, Text Mining and Music Mining **[Video]**

Dec.2020 ICSA 2020 Applied Statistics Symposium - Texas (Virtual), US - ICSA2020
Poster, Bayesian and Unsupervised Machine Learning Machines forJazz Music Analysis

Aug.2020 SIAM Conference on Mathematics of Planet Earth - California (Virtual), US - MPE20
Contributed, Statistical Wind Conditions Assessment across inland and off-shore US under Future Climate Scenarios

Aug.2020 Joint Statistical Meetings 2020 - Philadelphia (Virtual), US - JSM2020
Contributed, Naive Dictionary On Musical Corpora: From Knowledge Representation To Pattern Recognition

Aug.2019 Argonne National Laboratory - ANL/MCS
Lightning Talk, Wind Conditions Assessment in North-America Under Climate Change Scenarios

Jul.2019 Joint Statistical Meetings 2019 - Denver, US - JSM2019
Poster, Exploratory analysis of Hurricane Storm Surge

May.2019 IMS/ASA Spring Research Conference - SRC 2019
Poster, Uncertainty Quantification in Tropical Cyclone Climatology

May.2019 Statistical Perspectives on Uncertainty Quantification (SPUQ) Workshop - SPUQ 2019
Poster, Exploratory Analysis of Tropical Cyclone Climatology

Apr.2019 6th Bayesian, Fiducial, and Frequentist (BFF) Conferences - BFF 2019
Poster, Bayesian and Unsupervised Machine Learning Machines for Jazz Music Analysis

Apr.2019 8th Annual Conference of the UPSTAT New York Chapters of ASA - UpStat 2019
Poster, Text Mining and Music Mining

Nov.2018 SAMSI Model Uncertainty Program Storm Surge Working Group - SAMSI
Seminar Talk, Initial Exploratory Analysis of Synthetic Storm Tracks *(30 minutes talk)*

Oct.2018 SAMSI Model Uncertainty Program Data Fusion Working Group - SAMSI
Seminar Talk, Data Fusion for Music Mining *(40 minutes talk)*

Oct.2018 International Conference on Advances in Interdisciplinary Statistics and Combinatorics - AISC
Contributed, Machine Learning for Music Mining with LDA Model, *SAMSI Academic Session*

Sep.2018 Data Science Research Group in Rochester Institute of Technology - DSRG
Seminar Talk, Statistical Aspects of Music Mining *(80 minutes lecture)*

Sep.2018 Cornell Day of Statistics 2018 - Cornell
Poster, Bayesian and Unsupervised Machine Learning Machines for Jazz Music Analysis

Jul.2018 Joint Statistical Meetings 2018 - Vancouver, Canada - JSM
Poster, Bayesian and Unsupervised Machine Learning Machines for Jazz Music Analysis

Apr.2018 7th Annual Conference of the UPSTAT New York Chapters of ASA - UpStat 2018
Contributed, Music Mining In Topic Modeling Approach For Improvisational Learning

Feb.2018 Graduate Seminar in Rochester Institute of Technology - RIT
Seminar Talk, Topic Modeling with LDA Tutorial *(80 minutes lecture)*

Nov.2017 Graduate Showcase in Neuroscience and Signal Processing Session - RIT
Contributed, Statistical Challenges of Echo State Networks

Nov.2017 6th Annual Conference of the UPSTAT New York Chapters of ASA - UpStat 2017
Contributed, Statistical Aspects about Echo State Networks

Professional Affiliation

- American Statistical Association (ASA)
- Institute of Mathematical Statistics (IMS)
- International Astrostatistics Association (IAA)
- International Society for Bayesian Analysis (ISBA)
- Astrostatistics and Astroinformatics Portal (ASAIP)
- International Chinese Statistical Association (ICSA)

Skills and Interests

- **Programming:** Python, R, SAS, MATLAB, LaTeX, SQL
- **Marathon:** Finish 26.2-mile journey in limited time, 2017, 2018, 2019
- **Music:** Perform Ghanaian and Senegalese music as member of African Percussion & Dance Ensemble
- **Other:** Piano, Hot Yoga, Surfing, Snowboarding, Hiking, Climbing, Taekwondo, Sketching, Culinary Arts